

Claims

- 5        1.    An automated immunoassay apparatus (1) comprising:  
         a movable arm (7a,7b); and  
         a pipette mechanism (6) for aspirating and/or  
dispensing fluid, said pipette mechanism (6) being  
connected to said movable arm (7a,7b);  
10        characterised in that:  
         said pipette mechanism (6) further comprises a pick-  
up means (23,27,31) for picking up and transporting one  
or more items other than a disposable tip (9).
- 15        2.    An automated immunoassay apparatus as claimed in  
claim 1, wherein said pick-up means (23,27,31) is  
suitable for picking up and ejecting a disposable tip  
(9).
- 20        3.    An automated immunoassay apparatus as claimed in  
claim 1 or 2, wherein said pick-up means (23,27,31)  
comprises a clamp (23,27,31).
- 25        4.    An automated immunoassay apparatus as claimed in  
claim 3, wherein said clamp (23,27,31) comprises a collar  
(27) which is movable in a first axial direction.
- 30        5.    An automated immunoassay apparatus as claimed in  
claim 4, wherein said clamp (23,27,31) further comprises  
a portion (23) which in use substantially resists  
movement in said first axial direction and co-operates  
with said movable collar (27) to clamp a pickup block  
(34) or other article disposed between said movable  
collar (27) and said portion (23).
- 35        6.    An automated immunoassay apparatus as claimed in  
claim 5, wherein said portion (23) engages in use with a  
disposable sample tip (9) or a reagent tip.

7. An automated immunoassay apparatus as claimed in claim 5 or 6, wherein said portion (23) is spring loaded and may move in a direction opposed to said first axial direction.

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8. An automated immunoassay apparatus as claimed in any preceding claim, wherein said one or more items are selected from a group comprising: a microplate (13), a plate holder (35), one or more sample tubes, a sample rack (4), a reagent container, a reagent rack (11), a control container, a control rack (15), and a tip rack (8;12).

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9. An automated immunoassay apparatus as claimed in any preceding claim, wherein said pick-up means (27,31) engages in use with a slot or recess (32) provided in a pickup block (34).

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10. An automated immunoassay apparatus as claimed in claim 9, wherein said pickup block (34) is connected to a holder (35) suitable for carrying a microplate (13).

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11. An automated immunoassay apparatus as claimed in claim 9 or 10, wherein said pick-up means (23,27,31) and/or said pickup block (34) further comprise anti-rotation means (27,36) for substantially preventing said pickup block (34) and any item attached thereto from rotating.

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12. An automated immunoassay apparatus as claimed in any preceding claim, wherein said pipette mechanism (6) has a sprung loaded cone portion (23) for engagement with a disposable tip (9).

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13. An Enzyme Linked ImmunoSorbent Assay system comprising automated immunoassay apparatus as claimed in any preceding claim.

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14. Apparatus for diagnosing biological, chemical or biochemical products comprising a pipette means (6) for aspirating and/or dispensing a fluid, said pipette means (6) having means (23) for receiving a disposable tip (9);  
5        characterised in that:  
      said pipette means (6) further comprises a clamp (23,27,31) for picking up items.
15. An Enzyme Linked ImmunoSorbent Assay apparatus  
10       comprising a fluid aspirating and/or dispensing means (6) having an integral clamp suitable for transporting one or more items selected from a group comprising: a microplate (13), a plate holder (35), one or more sample tubes, a sample rack (4), a reagent container, a reagent rack  
15       (11), a control container, a control rack (15), and a tip rack (8;12).
16. Immunoassay apparatus comprising a pipette mechanism (6) having an integral plate clamp (23,27,31) for picking  
20       up a pick-up block (34) and items attached thereto.
17. Enzyme Linked ImmunoSorbent Assay apparatus comprising a movable arm (7a,7b) with both a fluid aspirating and/or dispensing means (6) and a pick-up  
25       means (27,31) suitable for picking up a microplate (13) provided on said arm (7a,7b).
18. An automated immunoassay apparatus (1) in combination with a pickup block (34) and/or a plate  
30       holder (35), said apparatus (1) comprising:  
      a movable arm (7a,7b); and  
      a pipette mechanism (6) for aspirating and/or dispensing fluid, said pipette mechanism (6) being connected to said movable arm (7a,7b);  
35       wherein said pipette mechanism (6) further comprises a pick-up means (23,27,31) for picking up and transporting said pickup block (34) and/or said plate holder (35).

19. A method of performing immunoassay procedures, comprising the steps of:

providing a movable arm (7a,7b)

5 aspirating and/or dispensing fluid using a pipette mechanism (6), said pipette mechanism (6) being connected to said movable arm (7a,7b);

characterised in that said method further comprises the step of:

10 picking up and transporting one or more items other than a disposable tip using a pick-up means (23,27,31) provided on said movable arm (7a,7b).

20. A method of performing immunoassay procedures as claimed in claim 19, further comprising the step of  
15 picking up a disposable tip (9) using said pick-up means (23,27,31).

21. A method of performing immunoassay procedures as claimed in claim 19 or 20, further comprising the step of  
20 ejecting a disposable tip (9) using said pick-up means (23,27,31).

22. An automated immunoassay apparatus comprising:  
at least one washer (17), reader (18) or incubator  
25 (16) module;  
characterised in that said apparatus further comprises:

a retractable drawer (14) for holding at least one first item selected from the group comprising: a  
30 microplate (13), a plate holder (35), one or more sample tubes, a sample rack (4), a reagent container, a reagent rack (11), a control container, a control rack (15), and a tip rack (8;12).

35 23. An automated immunoassay apparatus as claimed in claim 22, wherein said retractable drawer (14) comprises an aperture through which a disposable tip (8;12) may be passed in use.

24. An automated immunoassay apparatus as claimed in claim 23, further comprising a chute (42) arranged for receiving a disposable tip (8;12) passed in use through said aperture in said retractable drawer (14) when said retractable drawer (14) is at least partially, preferably fully extended.

25. An automated immunoassay apparatus as claimed in claim 24, wherein said chute (42) is generally aligned with said aperture in said retractable drawer (14) when said retractable drawer (14) is at least 50%, preferably fully extended.

26. An automated immunoassay apparatus as claimed in any of claims 22-25, wherein said retractable drawer (14) is arranged to hold at least one, at least two, at least three or at least four microplates (13).

27. An automated immunoassay apparatus as claimed in any of claims 22-26, wherein said retractable drawer (14) is at least partially, preferably fully retractable whilst said at least one first item is held, in use, on said retractable drawer (14).

28. An automated immunoassay apparatus as claimed in any of claims 22-27, wherein said retractable drawer (14) is movable over a first horizontal area in a first horizontal plane and wherein one or more second items are arranged in use in a second horizontal area in a second horizontal plane different from said first horizontal plane, said first and second horizontal areas at least partially overlapping, and wherein said one or more second items are selected from the group comprising: a microplate (13), a plate holder (35), one or more sample tubes, a sample rack (4), a reagent container, a reagent rack (11), a control container, a control rack (15), and a tip rack (8;12).

29. An automated immunoassay apparatus as claimed in any of claims 22-28, wherein said at least one first item comprises a microplate (13) and said apparatus further comprising transport means (23,27,31) for moving said  
5 microplate (13) to said at least one washer (17), reader (18) or incubator (16) module.

30. An automated immunoassay apparatus as claimed in any of claims 22-29, further comprising transport means  
10 (23,27,31) for moving said at least one first item, said transport means (23,27,31) comprising a pipette means (6) having an integral clamp.

31. An automated immunoassay apparatus as claimed in  
15 claim 30, wherein said transport means (23,27,31) comprises an end portion (23) for receiving a disposable tip (8;12) and a collar portion (27), said collar portion (27) being movable to clamp a said first item and/or to eject a disposable tip (8;12) held on said end portion  
20 (23).

32. A method of performing immunoassay procedures, comprising the steps of:  
providing at least one washer (17), reader (18) or  
25 incubator (16) module;  
characterised in that said method further comprises the step of:  
using a retractable drawer (14) to hold at least one item selected from the group comprising: a microplate  
30 (13), a plate holder (35), one or more sample tubes, a sample rack (4), a reagent container, a reagent rack (11), a control container, a control rack (15), and a tip rack (8;12).

33. A method of performing immunoassay procedures as claimed in claim 32, wherein said at least one item comprises a microplate (13), said method further comprising the step of transporting said microplate (13)